# AGARD and RTO Technical Publications: a quarterly listing

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**19990008907** Research and Technology Organization, RTO Applied Vehicle Technology Panel, Neuilly-sur-Seine, France
**Intelligent Processing of High Performance Materials** ***Le Traitement Sophistique de Materiaux Tres Performants***
Nov. 1998; 164p; In English, 13-14 May 1998, Brussels, Belgium; See also 19990008908 through 19990008923
Report No.(s): RTO-MP-9; AC/323(AVT)TP/5; ISBN 92-837-1004-5; Copyright Waived; Avail: CASI; A08, Hardcopy; A02, Microfiche

This report contains the papers presented at a Workshop on Intelligent Processing of High Performance Materials organised by the Applied Vehicle Technology Panel (AVT) of RTO, in Brussels, Belgium, 13-14 May 1998. The papers describe various aspects of intelligent processing, a methodology for simulating and controlling the processing and manufacturing of materials, which is finding widespread application during the manufacture of functional electronic, photonic, and composite materials as well as primary metals such as steel and aluminium. The papers are presented under the following headings: Overview and analytical techniques, Metallic materials applications, and Non-metallic materials applications.
Author
*Process Control (Industry); Artificial Intelligence; Materials Science; Manufacturing; Composite Materials; Computerized Simulation; Metals*

**19990009499** Research and Technology Organization, RTO Applied Vehicle Technology Panel, Neuilly-sur-Seine, France
**Airframe Inspection Reliability Under Field/Depot Conditions** ***Degre de Fiabilite des Visites d'Inspection des Cellules en Depot et en Conditions Operationnelles***
Nov. 1998; 202p; In English, 13-14 May 1998, Brussels, Belgium; See also 19990009500 through 19990009518
Report No.(s): RTO-MP-10; AC/323(AVT)TP/2; ISBN 92-837-1002-9; Copyright Waived; Avail: CASI; A10, Hardcopy; A03, Microfiche

Papers presented at a Workshop on Airframe Inspection Reliability under Field/Depot Conditions organised by the Applied Vehicle Technology Panel (AVT) of RTO, in Brussels, Belgium, 13-14 May 1998 are presented. The Workshop had the general objective of promoting general discussion on the merits and practicality of generating NDI Probability of Detection (POD) from in-service data and on the use of reliability data in the life-cycle management process. The papers are presented under the following headings: (1) Perspectives on: the role of NDI, factors influencing eddy current POD in the field environment, and NDT reliability; (2) Estimation from small samples and in-service experience; Approaches to POD generation; Analytical issues related to generation and use of POD data; and Practical experience and case studies.
Author
*Airframes; Inspection; Nondestructive Tests; Fatigue (Materials); Aircraft Reliability; Service Life; Failure Analysis; Aircraft Maintenance; Structural Analysis*

**19990014353** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine, France
**Aerospace 2020, Volume 3, Background Papers** ***Aeronautique et Espace a l'Horizon 2020, Volume 3***
Aerospace 2020; Sep. 1997; 148p; In English; See also 19990014354 through 19990014383
Report No.(s): AGARD-AR-360-Vol-3; ISBN-92-836-1059-8; Copyright Waived; Avail: CASI; A07, Hardcopy; A02, Microfiche

Volume III is comprised of the technical papers supporting the report of the NATO Advisory Group for Aerospace Research and Development (AGARD) study: "Aerospace 2020". This study explored the most advanced technologies, relevant to aerospace, being researched and developed in laboratories today. The study focused on the most promising current technologies and the organizational and tactical consequences they will have at the field and system levels, over the course of the next 25 years. Topics include: a discussion of the impact of proliferation, human-machine interaction, synthetic environments, directed-energy weapons, information technologies, unmanned tactical aircraft, suborbital launchers, hypersonic missiles, and a discussion of affordability issues. Technologies are assessed from the viewpoints of both potential capabilities and threats. Observations and recommendations are presented. Volume II contains the conclusions of the report. Volume I is a short summary of these conclusions.
Author
*Aerospace Engineering; Technology Assessment; Fluid Dynamics; Mission Planning; Aircraft Design; Weapon Systems; Hypersonic Aircraft; Human Factors Engineering; Man Machine Systems*

**19990017801** Research and Technology Organization, Applied Vehicle Technology Panel, Neuilly-sur-Seine, France
**Missile Aerodynamics** ***Aerodynamique des Missiles***
Nov. 1998; 526p; In English; In French, 11-14 May 1998, Sorrento, Italy; See also 19990017802 through 19990017840; Original contains color illustrations
Report No.(s): RTO-MP-5; AC/323(AVT)TP/3; ISBN 92-837-0002-3; Copyright Waived; Avail: CASI; A23, Hardcopy; A04, Microfiche

This report contains the papers prepared for the Symposium on 'Missile Aerodynamics' organised by the RTO Applied Vehicle Technology Panel (AVT), which was held 11-14 May 1998 in Sorrento, Italy. In addition, a Technical Evaluation Report aimed at assessing the success of the Symposium in meeting its objectives, and an edited transcript of the General Discussion held at the end of the Symposium are also included. This Symposium was dedicated to the memory of Dr. Jack Nielsen and a keynote paper addressed his contributions to Missile Aerodynamics. An additional keynote paper was presented on Future Missile System Trends and their Impact on Aerodynamics. In addition to the keynote presentations, 38 Papers were presented during sessions on the following subjects: Aerodynamic Design, Unconventional Configurations, Jet Effects, Flows Physics and Turbulence Modeling, and Prediction Methodology.
Author
*Missiles; Missile Configurations; Aerodynamics; Missile Design; Jet Flow; Aerodynamic Characteristics*

**19990018045** Research and Technology Organization, Systems Concepts and Integration Panel, Neuilly-sur-Seine, France
**The Application of Information Technologies (Computer Science) to Mission Systems** ***L'Application des Technologies de l'Information (l'Informatique) aux Systemes de Conduite de Mission***
Nov. 1998; 254p; In English, 20-22 Apr. 1998, Monterey, CA, USA; See also 19990018046 through 19990018067
Report No.(s): RTO-MP-3; AC/323(SCI)TP/1; ISBN 92-837-1006-1; Copyright Waived; Avail: CASI; A12, Hardcopy; A03, Microfiche

This volume contains the Technical Evaluation Report, and the 21 unclassified papers, presented at the Symposium of the Systems Concepts and Integration Panel (SCI) held in Monterey, California, USA, 20-22 April 1998. The papers presented covered the following headings: Information System Architecture, information Availability about Mission Situation, Knowledge Availability, and Systems.
Author
*Conferences; Information Systems; Command and Control; Architecture (Computers); Space Missions*

**19990018200** Research and Technology Organization, Systems Concepts and Integration Panel, Neuilly-sur-Seine, France
**Non-Cooperative Air Target Identification Using Radar** ***L'Identification Radar des Cibles Aeriennes Non Cooperatives***
Non-Cooperative Air Target Identification Using Radar; Nov. 1998; 308p; In English; In French, 22-24 Apr. 1998, Mannheim, Germany; See also 19990018201 through 19990018231; Original contains color illustrations
Report No.(s): RTO-MP-6; AC/323(SCI)TP/2; ISBN 92-837-0000-7; Copyright Waived; Avail: CASI; A14, Hardcopy; A03, Microfiche

Contains the unclassified papers presented at a Symposium on Non-Cooperative Air Target Identification using Radar organized by the Systems Concepts and Integration Panel (SCI) of RTO, in Mannheim, Germany, 22-24 April 1998. Novel solutions to the Non-Cooperative Target Identification (NCTI) Problem, using radar are proposed. The papers are presented under the following headings: System requirements Target characterisation Radar measurements and feature extraction Target classification Scattering techniques, target modelling and validation
Author
*Conferences; Pattern Recognition; Targets; Documents*

**19990018232** Research and Technology Organization, Neuilly-sur-Seine, France
**Fluid Dynamics Research on Supersonic Aircraft** ***Les Travaux de Recherche en Dynamique des Fluides Relatifs aux Aeronefs Supersoniques***
Fluid Dynamics Research on Supersonic Aircraft; Nov. 1998; 332p; In English, 25-29 May 1998, Rhode-Saint-Genese, Belgium; See also 19990018233 through 19990018251
Report No.(s): RTO-EN-4; AC/323(AVT)TP/6; ISBN 92-837-1007-X; Copyright Waived; Avail: CASI; A15, Hardcopy; A03, Microfiche

This report Contains the lecture notes prepared for a Special Course on 'Fluid Dynamics Research on Supersonic Aircraft' organized by the Research and Technology Organization (RTO) Applied Vehicle Technology Panel (AVT). The Course was held at the von Karman Institute for Fluid Dynamics (VKI) Institute, Rhode-Saint-Genese, Belgium 25-29 May 1998. The following topics were covered: History and Economics of Supersonic Transports, Supersonic Aerodynamics, Sonic Boom Theory and Minimization, Multi-Point Design Challenges, Vortex Plume Interactions, Propulsion System Design. Presentations on the major world wide supersonic transport programs were also included. The material assembled in this publication was prepared under the combined sponsorship of the RTO Applied Vehicle Technology Panel, the Consultant and Exchange Program of RTO, and the von Kdrmdn Institute (VKI) for Fluid Dynamics.
Author
*Research Aircraft; Supersonic Transports; Computational Fluid Dynamics; Conferences*

**19990018297** Research and Technology Organization, Neuilly-sur-Seine, France
**E-O Propagation, Signature and System Performance under Adverse Meteorological Conditions Considering Out of Area Operations** ***La propagation, la signature et les performances des systemes optroniques dans des conditions meteorologiques defavorables compte tenu des operations hors zone***
E-O Propagation, Signature and System Performance under Adverse Meteorological Conditions Considering Out of Area Operations; Sep. 1998; 352p; In English; Sensors and Electronics Technology Panel Symposium, 16-19 Mar. 1998, Naples, Italy; Sponsored by Research and Technology Organization, France; See also 19990018298 through 19990018333
Report No.(s): RTO-MP-1; AC/323(SET)TP/2; ISBN 92-837-0001-5; Copyright Waived; Avail: CASI; A16, Hardcopy; A03, Microfiche

This publication contains the papers presented at a specialists' meeting sponsored by the Sensors and Electronics Technology Panel of the RTO. The topics covered included: (1) Theoretical and practical aspects of atmospheric propagation under adverse conditions; (2) Out-of-area operations, variations in weather conditions and propagation phenomena; (3) System optimization techniques for out-of-area applications; (4) Modelling techniques; (5) Measurement programs, including existing collaborations; and (6) Applications of dual use technologies for adverse conditions (military/commercial).
Author
*Electro-Optics; Atmospheric Effects; Mathematical Models; Wave Propagation; Performance Tests; Meteorological Parameters; Weather; Electromagnetic Wave Transmission*

**19990018334** Research and Technology Organization, Human Factors and Medicine Panel, Neuilly-sur-Seine, France
**Collaborative Crew Performance in Complex Operational Systems** ***L'Efficacite du Travail en Equipage dans des Systemes Operationnels Complexes***
Collaborative Crew Performance in Complex Operational Systems; Dec. 1998; 390p; In English, 20-22 Apr. 1998, Edinburgh, UK; See also 19990018335 through 19990018371; Original contains color illustrations
Report No.(s): RTO-MP-4; AC/323(HFM)TP/2; ISBN 92-837-1008-8; Copyright Waived; Avail: CASI; A17, Hardcopy; A04, Microfiche

Research and applications in human factors has frequently only considered individual operator interfaces, for limited work domains in well-defined scenarios, as evaluated by unitary measures. As we progress towards the next millennium, complex operations will increasingly require consideration and integration of the collaborative element wherein crew performance

becomes a critical factor for success. The goal of this symposium has been to bring together a global perspective on issues and factors that need to be understood when systems design is focused on the crew operating in a complex environment. Hence, the papers contained in these proceedings give the reader a broad, multidisciplinary view of needs, requirements, ongoing research and development projects, and various research agendas that will bring about new technologies, approaches, and measures with regard to collaborative crew performance. The papers and multiple perspectives contained in these proceedings provide a baseline for understanding many elements of crew performance and in that sense will be valuable for the human factors specialist that must now design for the collaborative element and be concerned with the broad bandwidth of complexities within the operational setting. Additionally, the volume provides information for researchers, scientists, and engineers in many different areas who find themselves immersed in collaborative systems design.
Author (revised)
*Human Factors Engineering; Man Machine Systems; Group Dynamics; Decision Making; Task Complexity*

**19990021564** Research and Technology Organization, Human Factors and Medicine Panel, Neuilly-sur-Seine, France
**Cervical Spinal Injury from Repeated Exposures to Sustained Acceleration** ***Les traumatismes de la colonne cervicale dus aux accelerations soutenues et repetitives***
February 1999; 104p; In English
Report No.(s): RTO-TR-4; AC/323(HFM)TP/9; ISBN 92-837-1013-4; Copyright Waived; Avail: CASI; A06, Hardcopy; A02, Microfiche

Published articles and reports on current studies by several nations on cervical neck injury, spinal degeneration and related topics are reviewed and analyzed in detail in the first 11 chapters. In Chapter 12 the biomechanics of the cervical spine and predictive models on cervical injury from sustained G exposures are presented. Meta-analysis of 8 control-studies on the direct effects of sustained G exposures on cervical degeneration was performed and presented in Chapter 13. The statistical probability of a causal relationship was determined to be P less than 0.001. In Chapter 14, this information was summarized and further developed into a model on the relationship between aging and sustained G exposures on cervical spinal degeneration. In this model, cervical spinal degeneration occurs with repeated exposures to sustained G and with aging. However because of the continuous and pervasive effects of aging, the pilot population and non-G exposed population (controls) are predicted to have the same levels of cervical degeneration later in life. Recommendations presented in the last chapter include the need for more research on this topic, the development of standardized nomenclature and databases, and specific considerations on the prevention and treatment of acute neck injuries.
Author
*Back Injuries; Spine; Spinal Cord; Acceleration Tolerance; Human Tolerances; Neck (Anatomy); Biodynamics; Acceleration Stresses (Physiology)*

**19990024917** Advisory Group for Aerospace Research and Development, Fluid Dynamics Panel, Neuilly-Sur-Seine, France
**Hypersonic Experimental and Computational Capability, Improvement and Validation, Volume 2** ***L'Hypersonique Experimentale et de Calcul: Capacite, Amelioration et Validation, Volume 2***
Muylaert, Jean, Editor, European Space Agency. European Space Research and Technology Center, ESTEC, Netherlands; Kumar, Ajay, Editor, NASA Langley Research Center, USA; Dujarric, Christian, Editor, European Space Agency, France; December 1998; 172p; In English; See also 19990024918 through 19990024923
Report No.(s): AGARD-AR-319-Vol-2; ISBN 92-836-1078-4; Copyright Waived; Avail: CASI; A08, Hardcopy; A02, Microfiche

The results of the phase 2 effort conducted under AGARD Working Group 18 on Hypersonic Experimental and Computational Capability, Improvement and Validation are presented in this report. The first volume, published in May 1996, mainly focused on the design methodology, plans and some initial results of experiments that had been conducted to serve as validation benchmarks. The current volume presents the detailed experimental and computational data base developed during this effort.
Author
*Data Bases; Hypersonic Flow; Computational Fluid Dynamics; Research Projects; Wind Tunnel Tests; Real Gases; Hypersonic Vehicles*

**19990025670** Advisory Group for Aerospace Research and Development, Aerospace Medical Panel, Neuilly-Sur-Seine, France
**Aeromedical Support Issues in Contingency Operations** ***Le Soutien Aeromedical Lors des Operations non Programmees***
September 1998; 420p; In English; In French, 29 Sep. - 1 Oct. 1997, Rotterdam, Netherlands; See also 19990025671 through 19990025721
Report No.(s): AGARD-CP-599; ISBN 92-836-0059-2; Copyright Waived; Avail: CASI; A18, Hardcopy; A04, Microfiche

These proceedings include the Technical Evaluation Report, two Keynote Addresses, 53 papers and the edited discussions of the Symposium sponsored by the North Atlantic Treaty Organization (NATO/RTO) Aerospace Medical Panel. It was held in Rotterdam, N-E from 29 September - 1 October 1997. Contingency Operations constitute military missions such as peacekeeping, humanitarian aid, peacemaking/enforcement, full scale offensive operations and relief operations other than war, such as aid to civil powers in counterterrorism and in natural disasters. Increasingly, these operations will involve greater NATO participation in the post ”Post-Cold-War” era. Significantly, NATO nations are turning to the application of science and technology, particularly computer resources, to address the unique problems associated with Contingency Operations. From a medical standpoint, there are many logistic, support and environmental factors which impede effective health and critical care medicine in Contingency Operations. This Symposium considered both the aeromedical problems encountered and the role of technological solutions as aids to resolving the issues in: (a) sustained and continuous operations, (b) medical management in remote locations, (c) medical information, and (d) adaptation to operational conditions. These proceedings will be of interest to heads of military health services, military and civilian officers concerned with the health and safety of personnel in air and support operations, research scientists, and those requiring a state-of-the-art review of medical ”lessons learned” in Contingency Operations.
Author

*Conferences; Contingency; Medical Services; Operations Research; Research and Development; Human Factors Engineering; Medical Personnel; Telemedicine; Medical Equipment; Life Support Systems; Aerospace Medicine; Biological Effects; Aircraft Safety*